EXHIBIT 613

166675

PROJECT WORK PLAN
SAAD TROUSDALE SITE
CRAWFORD AND ASSOCIATES, INC.

TASK 1: **Project Work Plan** July 12-24.

Prepare Work Plan outlining projected time lines, procedures and methodologies for dye trace investigation and submit to Weston.

TASK 2: **Literature Review** July 15-30.

Review all existing site reports and hydrogeologic reports about the area.

TASK 3: **Obtain Permits** July 24-30.

Prepare dye trace permit applications for six dye traces and submit to Underground Injection Control Branch, Tennessee Division of Water.

TASK 4: **Prepare Working Base Maps** July 24-30.

Obtain copies of the following and transfer pertinent information onto a working base map:

a) Topographic Quadrangle Maps
b) Geologic Quadrangle Maps
c) Air photos - Nashville Public Works
d) Large scale maps - Nashville Public Works
e) Soil Atlas of Davidson County
f) Flood maps along creeks - Corps of Engineers
g) Cave maps
h) Storm sewer maps - Nashville Public Works and CSX Railroad
i) Sanitary sewer maps - Nashville Public Works
j) Site maps - CSX Railroad Radnor Yard
k) Site maps - GE Maintenance Site
l) Site maps - Saad site maps from previous investigations

TASK 5: **Order Supplies and Prepare Dye Receptors and Field Equipment** July 12-30.

a) Dyes
b) Dye receptors
    1) Coconut charcoal
    2) Unbleached cotton
    3) Plastic sample bags
    4) Latex gloves
    5) Floaters to suspend dye receptors above stream floor
    6) Paper clips

7) Name tags
8) Black twine for attaching dye receptors to trees and anchors
9) Fiberglass screen material
10) Monofilament thread for sewing fiberglass bags
11) Staplers and staples (2)
12) Field packs for carrying supplies (2)

c) Sew 1000 fiberglass screen dye receptor bags
d) Conductivity meters (2)
e) pH meters (1)
f) Cameras for photographing springs (2)
g) Flagging for marking springs
h) Machete (2)
i) Spring inventory forms on clip board (2)
j) Permanent markers for labeling plastic bags
k) Coolers for transporting dye receptors to laboratory (2)
l) Bottles (40 ml) for grab samples

TASK 6: Karst Hydrogeologic Inventory August 1-5.

a) Spring inventory - Springs and seeps will be located by walking or floating all streams surrounding the site.

b) The following information will be recorded on the Karst Hydrogeologic Inventory Form about each spring.

1) Spring name
2) Location
3) Description
4) Photograph
5) Landowner and address
6) Temperature
7) Discharge
8) Specific conductance
9) pH

c) Other karst features: Caves, karst windows, sinking streams, losing streams, sinkholes. These features will be identified from maps, soil atlas, air photos, information provided by landowners and by walking over the area. All features will be field investigated and the above listed information recorded on the Karst Hydrogeologic Inventory Form.

2 4 0005

KARST HYDROGEOLOGIC INVENTORY FORM

CRAWFORD AND ASSOCIATES, INC.

Project Name____________ Date__________ Time__________

Person(s) Completing Karst Inventory Form____________________

Feature:
_____Spring _____Sinking Stream _____Karst Window
_____Seep _____Losing Stream _____Cave with Stream
_____Sinkhole _____Surface Stream _____Cave without Stream

Inventory Number_______ Location (Latitude and Longitude)__________

Name of Feature________ Location (Description)____________________

Landowner__________

Address__________

Discharge_____Measured___ Estimated___ Dye Receptor Location(s)____________________

Temperature_______

Specific Conductance_______

pH______ Comments____________________

Photograph

TASK 7: Installation of Background Dye Receptors August 1-5.

The passive dye receptors to be used are small packets constructed of fiberglass screen mesh with activated coconut charcoal in one chamber and a bundle of unbleached cotton in the other. These are placed in all springs, cave streams, karst windows, surface streams, and selected monitoring wells and water wells and left for approximately one week. They are then replaced with new receptors and the background receptors are analyzed in the laboratory along with water samples collected at each site for background fluorescence. Background fluorescence will be considered in selecting dyes to be used for the investigation.

Two sets of passive dye receptors will be installed at each location to be monitored for dye. Where possible, they will be placed about 100 feet apart. Dye receptors will be attached to large rocks with black nylon twine. A floater will be attached to each receptor to suspend it above the stream bottom as to allow water to flow through the packet at all times. Gumdrops may be used in deep springs, karst windows and surface streams. In small springs with shallow water the dye receptors will be placed to maximize the amount of flow past the receptors. The stream channel may be modified by digging and placing large rocks in positions to increase the flow past the dye receptors. In shallow water large flat rocks may be placed over the dye receptors to conceal them and to reduce photochemical decay from sunlight. However, these rocks must be resting upon another rock so that they form a roof over the dye receptors. They must not press the receptors into the stream bed and thus reduce the amount of flow past them. The dye receptors will be secured with black nylon twine to a nearby tree or rock. They will be tied high enough so that they can be retrieved during high water (typically 10 or more feet above the existing water level). ll dye receptors will be constructed no more than one day previous to installation in the field. Each dye receptor set, consisting of the activated charcoal/unbleached cotton dual chamber packet will be sealed within a small plastic bag. Each bag will contain the following:

1. Activated charcoal/unbleached cotton packet
2. Large paper clips for attaching packets to rocks or gumdrops
3. Identification tag
4. Disposable latex gloves (new gloves will be used at each dye receptor site)
5. A 40 ml bottle for collecting a grab sample

Upon retrieval, each dye receptor will be washed off in the stream and then placed in a small plastic bag. The bag will be identified in permanent ink with the following information:

1. Identification number
2. Name of spring
3. Date and time
4. Initials of person collecting the receptor

The collected dye receptors will be placed in a locked cooler in the trunk of a car. A Chain of Custody Form will be prepared for the receptors and they will be delivered to the Crawford and Associated Laboratory and placed in a locked refrigerator to await analysis.

TASK 8: Potentiometric Surface Investigation August 1-5.

All accessible water wells and monitoring wells in the area will be measured during a dry period and the depth to water subtracted from the ground surface elevation which will be estimated from a 10 foot contour interval 7.5 minute USGS topographic quadrangle map or a 2 foot contour interval city map. Elevations at selected wells, springs and streams may be determined by leveling from benchmarks. A water level measurer will be used to measure the water surface elevation.

TASK 9: Retrieval of First Set of Background Dye Receptors August 8.

One of the two sets of passive dye receptors at each monitoring site will be exchanged and analyzed for background fluorescence. The observed background fluorescence will be considered in making the decision about the dyes to be used.

TASK 10: Retrieval of Second Set of Background Dye Receptors August 12.

Previous to dye injection, both sets of dye receptors at each monitoring site will be exchanged and the one installed on August 8 will be analyzed for background fluorescence. Although both sets of receptors will be exchanged each week, only one set will be analyzed. The other set is simply a back-up to be used in the event that one set is stolen or lost. Also, ten percent of the backup receptors will be analyzed as duplicates for QA/QC.

TASK 11: Installation of ISCO Automatic Water Samplers August 12.

Two ISCO automatic water samplers will be installed. One will be located at Croft Spring and the other will be on the spring that continuously flows from the CSX Radnor Yard storm sewers or on a spring near the head of Brown's Creek. After the first three dyes are injected, samples will be collected at a two-hour interval for two days, then a four-hour interval for twelve days, than an eight-hour interval for sixteen days. This sequence will be repeated after the second three dyes are injected.

TASK 12: Dye Injection of First Three Dyes August 12.

After the completion of the hydrogeologic inventory, the potentiometric surface map, the analysis of the background dye receptors, the placement of dye receptors in all springs, karst windows, cave streams, surface streams and selected monitoring wells and water wells and the installation of the two ISCO samplers, three dyes will be injected directly into a sinkhole, monitoring well, piezometer or hole excavated in the soil. Water from a hose or a water truck will be used to flush the dye past the soil into a bedrock crevice which leads to a cave stream. Usually about 500 gallons of water are injected into the hole to make sure that it drains sufficiently and to wet the soil so that less dye will be sorbed by clays. The dye is then injected and flushed with at least 2000 gallons of water. Usually three or four dye traces can be performed simultaneously by using different dyes.

The dyes usually used are:

a) Eosine - Color Index: Acid Red 87
b) Fluorescein - Color Index: Acid Yellow 73
c) Optical Brightener - Tinopal CBS-X, Fabric Brightening Agent 351
d) Rhodamine WT - Color Index: Acid Red 388
e) Diphenyl Brilliant Flavine 7GFF - Color Index: Direct Yellow 96

These are standard dyes often used for dye traces in karst aquifers. They are safe for this purpose in the concentrations used both for human consumption and aquatic life (Smart, 1986).

We plan to inject the first three dyes into three existing monitoring wells or piezometers. Rhodamine WT, Eosine and Tinopal CBS-X, will be injected into SSS1 at the Saad Site, SSLN1 or P-2 at the CSX Radnor Yard sinkhole area, and at one of the wells at the GE Maintenance Facility Site. Actual selection of the dye injection sites will be determined after a capacity test has been performed on each of the wells to make sure that they will take the dye and flush water. If these wells have been plugged or if they are so tight that they have very little capacity, it may be necessary to install dye injection pits.

TASK 13: Weekly Collection and Analysis of Passive Dye Receptors August 19-October 7

Dye receptors will be changed weekly after dye injection on August 12 for a period of eight weeks.

TASK 14: Dye Injection of Second Three Dyes September 9

After the completion of the first three traces (about four weeks), the second three dyes, probably Fluorescein, Direct Yellow 96 and Rhodamine WT, will be injected at three additional locations. This is assuming that the dyes from the first three traces go to Croft Spring and/or Browns Creek where the ISCO samplers will be placed. If not, at least one sampler will have to be moved and one or more traces repeated in order to obtain a quantitative trace with a dye breakthrough curve. The selection of the second three dye injection points should not be made until the first three are completed. Then we will know where we need additional groundwater flow information, particularly to establish groundwater divides. Possible sites include P-5, P-1 or CSX-1 on the CSX Site. Another location may be selected somewhere between the GE Site and Saad Site. If there are no existing monitoring wells in these locations suitable for dye injection, a trackhoe (excavator) will be used to dig s dye injection pit. Although in some areas the depth to bedrock may be too deep to install a dye injection pit, well data indicates that in many areas it is less than 20 feet.

TASK 15: Weekly Dye Receptor Analysis August 8-October 7.

Usually within 4 to 10 days (depending on weather and other factors) the dye receptors are replaced, and the ones collected are then analyzed for dye. The activated charcoal is washed and then 1 gram of it is treated with 10 ml of a 5:2:3 mixture of 1-propanol, concentrated ammonium hydroxide and distilled water (Smart, 1972), to elute Fluorescein, Eosine, and

Rhodamine WT from the charcoal. The elutant is then compared with the elutant of the background receptor on a Shimadzu Spectrofluorophotometer RU 5000. The unbleached cotton re receptors are washed to remove as much mud as possible, and then tested for Optical brightener and Direct Yellow 96 under a long-wave ultraviolet lamp. Optical brightener, if present, will glow a blue-white, and Direct Yellow 96, if present, will glow a pale yellow.

TASK 16: Quantitative Analysis of Water Samples Collected by ISCO Samplers August 12-October 7.

Water samples collected by the two ISCO Samplers will be analyzed quantitatively for Rhodamine WT, Fluorescein and Eosine on a Shimadzu Spectrofluorophotometer RU 5000. This will provide a dye breakthrough curve for each quantitative trace.

TASK 17: Report and Maps of Groundwater Flow October 7- October 31.

This research will result in a map showing the following for the vicinity of the site:

a) Groundwater elevations of all springs, monitoring wells and water wells measured.
b) Potentiometric surface of the water table aquifer.
c) All springs, cave streams, karst windows and sinking streams in the research area.
d) Generalized groundwater flow routes through the aquifer as determined from the dye traces and water table data.

The report will discuss the hydrogeology of the site as determined by the dye trace, potentiometric surface and geologic investigations. This will include one or more hydrogeologic cross-sections showing groundwater flow through the karst aquifer from dye injection points to springs.

TIME SCHEDULE

As stated in the bid for this project, this is not a good time of year for a dye trace investigation because of dry weather conditions. The dates indicated in this Work Plan are tentative. We will need to inject dye during wet periods when all the springs are flowing. If we do not, we may have to repeat some of these traces during the winter or spring.